

WHAT IS CLAIMED IS:

1. A method to manufacture a biodegradable molded article comprising the steps of:

preparing: a slurry or dough molding material mainly made
5 of starch or a derivative thereof and obtained by adding water therewith; and a coating film mainly made of a biodegradable plastic and having hydrophobicity; and

heating and molding the molding material and the coating
10 film in a mold having a given-shaped cavity to mold the molding material through steam expansion, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding, wherein

said mold has an exhaust hole; and

15 in the heating and molding step, a gas existing between the coating film and a surface of the mold is discharged out of the cavity through the exhaust hole.

2. A method to manufacture the biodegradable molded article as set forth in claim 1, wherein

20 a space leading to the cavity through the exhaust hole is formed inside the mold, and

in the heating and molding step, the space is hermetically separated from outside the mold.

3. A method to manufacture the biodegradable molded
25 article as set forth in claim 2, wherein the hermetically

separated space has a volume set between a third and twice that of a void in the cavity before heating and molding.

4. A method to manufacture the biodegradable molded article as set forth in claim 1, wherein the gas existing
5 between the coating film and a surface of the mold is discharged out of the mold through the exhaust hole in the heating and molding step.

5. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 4, wherein the
10 exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2 .

6. A method to manufacture a biodegradable molded article comprising the steps of:

preparing: a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water
15 thereto; and a coating film mainly made of a biodegradable plastic and having hydrophobicity; and

heating and molding the molding material and the coating film in a mold having a specific cavity to mold the molding material through steam expansion, and at the same time soften
20 and pressure-bond the coating film to a surface of a biodegradable expanded molded article obtained through steam expansion molding,

inside said mold of a deep drawing shape the molding material and the coating film being placed substantially flat
25 for heating and molding to manufacture a biodegradable molded

article of a deep drawing shape.

7. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 6, wherein

5 a mold made up of a pair of a convex mold and a concave mold is used,

the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

10 in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these two molds fit together, and

15 at least while the coating film is being deformed, the convex mold and the concave mold are straightly moved closer to each other.

8. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 7, wherein

a mold made up of a pair of a convex mold and a concave mold is used,

20 the molding material and the coating film are placed between the convex mold and the concave mold before the heating and molding,

25 in the heating and molding step, a central part of the coating film is deformed by moving at least either one of the convex mold and the concave mold in a direction where these

two molds fit together, and

at least until the coating film starts to deform, both the convex mold and the concave mold are moved closer to each other.

5 9. A method to manufacture a biodegradable molded article comprising the steps of:

preparing: a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto; and a coating film mainly made of a biodegradable plastic and having hydrophobicity; and

10 heating and molding the molding material and the coating film in a mold having a given-shaped cavity to molding an expanded molded article through steam expansion by, and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article,

15 a mold made up of a pair of a convex mold and a concave mold being used,

the molding material and the coating film being placed between the convex mold and the concave mold before the heating and molding,

20 in the heating and molding step, a central part of the coating film being deformed by moving at least either one of the convex mold and the concave mold in a direction wherein these two molds fit together, and at least while the coating film is being deformed, a relative moving speed of the convex

mold to a plane formed by connecting a surface of non-deforming parts on an outer periphery of the coating film being maintained from 8 mm/s to 12 mm/s.

10. A method to manufacture the biodegradable molded article as set forth in claim 9, wherein the convex mold and the concave mold are straightly moved closer to each other at least while the coating film is deformed.

11. A method to manufacture the biodegradable molded article as set forth in claim 9 or 10, wherein both of the convex mold and the concave mold are moved to approximate each other at least until the coating film starts to deform.

12. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 11, wherein the heating is done so that the mold has a temperature not less than a softening point of the coating film and at least 10°C lower than the melting point thereof.

13. A method to manufacture a biodegradable molded article comprising the steps of:

preparing; a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto; and a coating film mainly made of a biodegradable plastic and having hydrophobicity; and

heating and molding the molding material and the coating film in a mold having a given-shaped cavity to mold the biodegradable expanded molded article through steam expansion ,

and at the same time soften and pressure-bond the coating film to a surface of a biodegradable expanded molded article,

said heating being done so that the mold has a temperature not less than a softening point of the coating film and at least 10° C lower than a melting point thereof.

14. A method to manufacture the biodegradable molded article as set forth in either claim 12 or claim 13, wherein the heating is done so that the mold has a temperature not less than 130°C.

15. A method to manufacture the biodegradable molded article as set forth in either claim 12 or claim 13, wherein the heating is done so that the mold has a temperature not less than 150°C.

16. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 15, wherein a slip agent is applied to a surface of the mold contacting the coating film before the heating and molding.

17. A method to manufacture the biodegradable molded article as set forth in claim 16, wherein the slip agent is a fluoroplastic layer formed on a surface of the mold.

18. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 17, wherein the coating film is a film mainly made of a denatured polyester.

19. A method to manufacture the biodegradable molded article as set forth in any one of claims 1 to 18, wherein the

coating film is a biaxially stretched film.

20. A mold to heat and mold a slurry or dough molding material mainly made of starch or a derivative thereof and obtained by adding water thereto through steam expansion,

5 said mold made up of a plurality of mold parts that can fit together and form an internal given-shaped cavity,

each of said mold parts having an exhaust hole there through to discharge a gas in the cavity outside piercing through.

10 21. A mold as set forth in claim 20, wherein inside the mold, an enclosed space is formed leading to the cavity through the exhaust hole and separated from outside the mold.

15 22. A mold as set forth in claim 20, wherein the exhaust hole leads to outside the mold to discharge a gas in cavity to the outside the mold.

23. A mold as set forth in claims 20 to 22, wherein the exhaust hole has a cross section between 0.12 mm^2 and 1.13 mm^2 .

20 24. A mold as set for in any one of claims 20 to 23, wherein the mold parts are made of a metal and an insulator is placed between the mold parts to insulate the mold parts from each other.

25 25. A mold as set forth in any one of claims 20 to 24 used for a method to manufacture a biodegradable molded article by heating and molding the molding material with the coating

film mainly made of a biodegradable plastic and having hydrophobicity through the steam expansion and at the same time softening and pressure-bonding the coating film to a surface of the biodegradable expanded molded article obtained through steam expansion molding,

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a fluoroplastic layer being formed on a surface contacting the coating film.